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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/741,532	12/19/2000	Venkatesan Murali	42390P10305	6371

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EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

4

DATE MAILED: 03/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

T.D-4

Office Action Summary

Application No.

09/741,532

Applicant(s)

MURALI, VENKATESAN

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5, 6, 7, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (US 5,604,835).

Nakamura teaches a method for making an optical device in a trench formed in the substrate (so-called making a photonic via in the claimed invention), see abstract.

In reference to claim 1, Nakamura teaches a narrow trench is formed in the silicon substrate (so-called making a hole in the substrate in the claimed invention). A cladding material may be deposited into the hole. An optical core material may be deposited into the hole (Fig. 1; col. 5, lines 9-15; col. 9, lines 60-62).

As to dependent claim 5, Nakamura teaches that the hole is made only partially through the substrate (Fig. 1).

As to dependent claim 6, Nakamura teaches that the hole is made to couple to a photonic component in the substrate (abstract or col. 1, lines 10-18).

In reference to claim 7, Nakamura teaches etching a trench in a substrate (col. 6, lines 2-3). A cladding material may be deposited into the trench. An optical core material may be deposited into the trench (Fig. 1; col. 5, lines 9-15; col. 9, lines 60-62).

In reference to claim 12, Nakamura teaches etching a trench in a silicon substrate (col. 6, lines 2-3). An oxide material may be deposited into the trench. (Fig. 1; col. 5, lines 9-12). A first polymer may be deposited into the trench. The polymer has an index of refraction higher than that of the oxide (col. 9, lines 57-62).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 4, 8, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 5,604,835) in view of Kenney et al. (US 6,311,004 B1).

Nakamura teaches a method for making an optical device in a trench formed in the substrate (so-called making a photonic via in the claimed invention), see abstract.

Nakamura teaches etching a trench (or making a hole) in a silicon substrate (col. 6, lines 2-3). An oxide (cladding) material may be deposited into the trench. (Fig. 1; col. 5, lines 9-12). A first polymer (or optical core material) may be deposited into the trench.

The said polymer (or optical core material) has an index of refraction higher than that of the oxide (col. 9, lines 57-62).

As to dependent claims 2, 8, and 14, Nakamura does not teach that a lens may be formed on top of the optical core material. However, it is a well-known feature in the art of optical system and is a choice of design depending on the product requirement. Kenny is relied on only to show this well-known feature. Kenny teaches that the silica cladding material and polymer may be placed between lenses (col. 17, lines 8-10). Hence, it would have been obvious to one with ordinary skill in the art to modify Nakamura by adding the lens on the optical core material (such as polymer) as taught by Kenny in order to provide their art recognized advantages and meet the specific product requirement.

As to dependent claims 4 and 13, Nakamura does not teach the method comprising polishing the substrate. However, it is a conventional process step in the art of electro-optic system fabrication to planarize the surface. Kenny is relied on only to show this conventional process step. Kenny teaches that the planarization (so-called polishing in the instant claims) may be used in the process, see col. 9, line 62. Hence, it would have been obvious to one with ordinary skill in the art to modify Nakamura by using this conventional process step as taught by Kenny in order to provide their art recognized advantages and produce an expected result.

5. Claims 3, 9-11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 5,604,835) and Kenney et al. (US 6,311,004

B1) as applied to claims 2, 4, 8, 13, and 14 above, and further in view of Lipscomb et al. (US 4,879,318).

As to dependent claims 3, 9, and 15, the combined prior art of Nakamura and Kenny do not teach the method of forming a lens by depositing a polymer (or second polymer in claim 15) and curing the polymer (or second polymer in claim 15). However, it is conventional steps for forming a lens in the art of optics system. In the method of forming the optical lenses, Lipscomb teaches that the optical lenses may be formed by depositing a polymer and curing the polymer (col. 1, lines 18-20; col. 6, lines 10-15). Hence, it would have been obvious to one with ordinary skill in the art to modify Nakamura and Kenny by using the said conventional steps for forming a lens as taught by Lipscomb in order to provide their art recognized advantages and produce an expected result.

As to dependent claim 10, as stated above and for the same reason, it is a conventional process step in the art of electro-optic system fabrication to planarize the surface. Hence, it would have been obvious to one with ordinary skill in the art to modify the combined prior art by using this conventional process step in order to provide their art recognized advantages and produce an expected result.

As to dependent claim 11, Nakamura teaches that an oxide material may be deposited into the trench (Fig.1; col. 5, lines 11-12).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-

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0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K-C C
March 11, 2002

Kin-Chen Chen
Patent Examiner
Group Art Unit 1765